

CLAIMS

WHAT IS CLAIMED IS:

1. A method to be performed by a computer system having at least one computer, storage media for physical implementation of an emulated sequence of instructions of the computer and translated from an original sequence of instructions, and at least one component that produces dynamic execution information, said method improving performance of the emulated sequence of instructions and comprising the steps of:

producing first dynamic execution information in response to executing the emulated sequence of instructions; and

changing the computer system for producing different dynamic execution information in response to said first dynamic execution information.

2. The method of claim 1, wherein:

said step of changing, includes modifying at least parameters of instructions of the emulated sequence of instructions.

3. The method of claim 1, wherein:

said step of changing, includes modifying at least register fields of instructions of the emulated sequence of instructions.

4. The method of claim 1, wherein:

said step of changing, includes software producing multiple conditions codes that replace a single condition code of the first dynamic execution information.

5. The method of claim 1, wherein:

said steps of executing, producing and changing are conducted recursively on at least some of successive segments of the emulated sequence of instructions.

6. The method of claim 1, further comprising:

providing the original sequence of instructions; and

generating the emulated sequence of instructions from the original

sequence of instructions.

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7. The method of claim 1, wherein:

said step of producing, produces branch prediction information; and

said step of changing, changes condition codes of the branch

prediction information.

8. The method of claim 1, wherein:

said step of producing, produces a history of register allocation

information; and

said step of changing, changes register allocation.

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9. The method of claim 1, wherein:

said step of producing, produces a history of branch prediction

dynamic execution information; and

said step of changing, generates a branch prediction likelihood code

for a group of branches that may be different from any branch prediction

of the members of the group.

10. The method of claim 1, wherein:

said changing, generates a modified emulated sequence of

instructions by modifying at least some instructions of the emulated

sequence of instructions in response to at least some of the dynamic

execution information.

11. A computer readable storage media having computer readable

code implementing a method for improving performance of an emulated

sequence of instructions, the code including statements for performing the

method of claim 1.

12. A computer readable storage media having computer readable
code implementing a method for improving performance of an emulated
sequence of instructions, the code including statements for performing the
method of claim 2.

13. A computer readable storage media having computer readable
code implementing a method for improving performance of an emulated
sequence of instructions, the code including statements for performing the
method of claim 3.

14. A computer readable storage media having computer readable
code implementing a method for improving performance of an emulated
sequence of instructions, the code including statements for performing the
method of claim 5.

15. A computer readable storage media having computer readable code implementing a method for improving performance of an emulated sequence of instructions, the code including statements for performing the method of claim 7.

16. A computer readable storage media having computer readable code implementing a method for improving performance of an emulated sequence of instructions, the code including statements for performing the method of claim 8.

17. An emulation sequence generator having the computer readable storage media of claim 11, and further comprising:

a node to provide an original sequence of instructions;

means for generating the emulated sequence of instructions from the original sequence of instructions; and

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an input to receive the execution information produced from
execution of the emulated sequence of instructions.

18. An emulation sequence generator having the computer readable
storage media of claim 12, and further comprising:

a node to provide an original sequence of instructions;

means for generating the emulated sequence of instructions from
the original sequence of instructions; and

an input to receive the execution information produced from
execution of the emulated sequence of instructions.

19. An emulation sequence generator having the computer readable
storage media of claim 14, and further comprising:

a node to provide an original sequence of instructions;

means for generating the emulated sequence of instructions from
the original sequence of instructions; and

an input to receive the execution information produced from
execution of the emulated sequence of instructions.

20. An emulation sequence generator having the computer readable
storage media of claim 15, and further comprising:

a node to provide an original sequence of instructions;

means for generating the emulated sequence of instructions from
the original sequence of instructions; and

an input to receive the execution information produced from
execution of the emulated sequence of instructions.

21. An emulation sequence generator having the computer readable
storage media of claim 16, and further comprising:

a node to provide an original sequence of instructions;

means for generating the emulated sequence of instructions from
the original sequence of instructions; and

an input to receive the execution information produced from
execution of the emulated sequence of instructions.

22. A computer system, including in combination the emulation
sequence generator of claim 18, and further comprising:

a computer coupled to said emulator;

storage media coupled to said computer;

said emulator, generating the emulated sequence of instructions
from the original sequence of instructions; and

means for producing the dynamic execution information from
execution of the emulated sequence of instructions.

23. A computer system according to claim 22, further comprising:

an additional computer; and

a network interconnecting said computer, said additional computer,
said storage media and said means for producing.

24. A computer system for improving performance of an emulated sequence of instructions, the system comprising:

at least one computer;

means for providing a physical implementation of an emulated sequence of instructions of said computer and produced from an original sequence of instructions;

a coupling between said computer and said media suitable to provide for execution of the emulated sequence of instructions on at least said computer;

means for producing dynamic execution information in response to the execution; and

means for responding to the dynamic execution information and for changing the computer system so that at least some dynamic execution information obtained on subsequent execution of the emulated sequence of instructions would be changed.

25. The system of claim 24, wherein:

said means for producing, maintains a record of branch addresses in the emulated sequence of instructions historically correlated to whether branches were taken during execution of the emulated sequence of instructions; and

said means for responding and changing, changes a likelihood condition code of the branch prediction information for at least one of the branches.

26. The system of claim 24, wherein:

said means for responding and changing, includes modifying at least parameters of instructions of the emulated sequence of instructions.

27. The system of claim 24, wherein:

said means for responding and changing, includes modifying at least

register fields of instructions of the emulated sequence of instructions.

28. The system of claim 24, wherein:

said means for responding and changing, includes cycling allocation
of registers in a pool of registers as some of successively identified
registers in the emulated sequence of instructions.

29. The system of claim 24, wherein:

said means for producing, produces a history of temporary register
allocation information; and

said means for responding and changing, changes register
parameters of the emulated sequence of instructions.

30. The system of claim 26, further comprising:

an emulation code generator generating the emulated sequence of
instructions executable a first instruction set from the original sequence of

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instructions executable with a different second instruction set;

said means for producing, generating historical register usage information regarding register status during execution of the emulation sequence of instructions; and

5 said means for responding and changing, modifying the emulated sequence of instructions in response to at least the historical register usage information.

31. The system of claim 24, further comprising:

10 an emulation code generator generating the emulated sequence of instructions executable a first instruction set from the original sequence of instructions executable with a different second instruction set;

15 said means for producing, generating historical branch prediction dynamic execution information regarding likelihood of branches taken during execution of the emulation sequence of instructions; and

said means for responding and changing, generating a branch

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prediction likelihood code for a group of branches that may be different from any branch prediction of the members of the group and is dependent upon a combined effect of the branch predictions of the members of the group.